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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/922,001	HALGREN ET AL.	
	Examiner	Art Unit	
	Christina Y. Leung	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-46* is/are rejected.

7)☒ Claim(s) *42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because many of the elements in Figures 1-6 are represented only as blank boxes (such as, but not limited to, elements 116, 118, 120, 122, etc. in Figure 2). The figures should include descriptive as well as numeric labels so that the structures they represent may be readily understood by those in the art. Examiner respectfully notes that the elements are otherwise only represented by symbols (rectangles of various size) that are similar in appearance and have no particular established meaning in the art.

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 42 is objected to because of the following informalities:

Claims 42 recites the word "duel" (sic) in line 2 of the claim. Examiner respectfully suggests that Applicants amend this word to "dual" for grammatical reasons.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 27, 28, 30-34, 36, 37, 39-43, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. (US 6,295,147 B1) in view of Watanabe (US 4,727,554 A) and Adams et al. (EP 1063803 A1; Lucent Technologies Inc., assignee).

Regarding claim 27, Yamane et al. disclose a WDM multiplexer structure for a WDM network (Figures 10 and 27) comprising:

a laser array comprising a plurality of laser sources (elements 100 shown in Figure 27, but one embodiment of a laser assembly 400 is shown in Figure 10);

active temperature controlling elements thermally coupled to the plurality of laser sources of the laser array (thermo-electric control element 6-2 associated with each laser diode 6-0; column 16, lines 8-28),

wherein the active temperature controlling elements maintain a controlled temperature environment around the plurality of laser sources of the laser array to maintain wavelength drifts

of the plurality of laser sources to be less than a WDM wavelength spacing of the WDM network (column 18, lines 48-59).

Although Figure 10 shows one transmission apparatus with one laser diode 6-0, Yamane et al. disclose that this apparatus is one of several transmission elements used in a WDM multiplexer structure such as shown in Figure 27 (column 15, lines 60-67; column 16, lines 1-8).

Yamane et al. disclose a plurality of active temperature controlling elements, each corresponding to a laser diode, and do not specifically disclose a common active temperature controlling element for all the laser diodes. However, Watanabe teach a system related to the one disclosed by Yamane et al., including means for controlling the temperature around a plurality of laser sources 1A-C in a laser array (Figures 1 and 2). Watanabe further teaches using a common active temperature controlling element thermally coupled to the plurality of laser sources (column 2, lines 29-68; column 3, lines 1-14). It would have been obvious to a person of ordinary skill in the art to use a common temperature controlling element as suggested by Watanabe instead of the individual temperature controlling elements disclosed by Yamane et al. in order to reduce the complexity and expense of the temperature control features of the system (Watanabe, column 1, lines 47-53).

Further regarding claim 27, Yamane et al. disclose wavelength division multiplexing signals but do not specifically disclose coarse wavelength division multiplexing signals or that the WDM multiplexer structure is a CWDM add/drop multiplexer for a CWDM network.

However, Adams et al. disclose an optical communication system related to the one disclosed by Yamane et al. including wavelength division multiplexed signals and a WDM network (Figure 2). Regarding claim 1 and also regarding claim 46 in particular, Adams et al.

further disclose that the WDM network is a coarse wavelength division multiplexing network and disclose a CWDM add/drop multiplexer structure of a CWDM network subjected to an outside temperature ambient experienced in an outside plant (OSP) situation (column 2, paragraph [0005]; column 3, paragraph [0008]). Regarding claim 43 in particular, Adams et al. teach a plurality CWDM filters each having a pass band substantially equal to the CWDM wavelength spacing of the CWDM network (column 2, paragraph [0005]).

Regarding claims 27, 43, and 46, it would have been obvious to a person of ordinary skill in the art to use the temperature controlled wavelength division multiplexer structure described by Yamane et al. in view of Watanabe within the CWDM network and CWDM add/drop multiplexers with filters suggested by Adams et al. in order to provide a WDM network that is advantageously easily upgradable and does not require extremely exact temperature control to function properly. Adams et al. suggest that "little or no temperature control" may be incorporated in the CWDM network (column 10, paragraph [0033]); Examiner notes that Adams et al. therefore do not teach away from using some temperature control with the CWDM system they teach.

Regarding claim 28, Yamane et al. do not explicitly refer to a low reference temperature value and a high reference temperature value. However, Yamane et al. clearly disclose that the controlled temperature environment is defined by a desired "reference" temperature value (column 16, lines 52-59). It would be well understood in the art that this reference value disclosed by Yamane inherently establishes a low reference (a value just below the disclosed desired reference) and a high reference (a value just above the disclosed desired reference), and

therefore, Yamane et al. inherently define low and high values for the controlled temperature environment.

Regarding claims 30 and 31, Yamane et al. disclose that the temperature controlling element and the laser array are located inside a housing. (column 16, lines 17-23) and that the temperature controlling element 6-2 operates based on a measured temperature (using thermistor 6-1, for example).

Regarding claim 32, Yamane et al. disclose that the measured temperature may be the actual temperature inside the housings (measured inside the housing by thermistor 6-1).

Regarding claims 33 and 34, Yamane et al. also disclose that the measured temperature may be an ambient temperature around the housing measured outside the WDM add/drop multiplexer structure (measured outside the housing by ambient temperature supervision circuit 8; column 17, lines 1-10).

Regarding claim 36, Yamane et al. disclose heat-generating components such as control circuitry 9 and other elements connected to the plurality of laser sources 6-0, and wherein controlling operation of the plurality of laser sources are located outside of the housing (as shown in Figure 10, for example). It is well understood in the art that electrical circuitry components and controller circuits such as disclosed by Yamane et al. generate some amount of heat in use.

Regarding claim 37, Yamane et al. disclose a driver unit (automatic current control circuit 9) for each of the plurality of laser sources 6-0 regulating a bias current of a respective laser source to compensate for variations in a power output of a semiconductor laser source as a

result of a tolerated temperature range of the controlled temperature environment (column 17, lines 11-19; column 19, lines 45-65).

Regarding claim 39, Yamane et al. disclose that each driver unit regulates the bias current based on the power output of the respective laser source (column 17, lines 15-19).

Regarding claim 40, Yamane et al. disclose that each driver unit provides a modulation current to the semiconductor laser source. Although Yamane et al. do not specifically use the word "modulation" in their specification, they clearly disclose that each laser outputs an optical signal with data based on an electric signal provided by the driver unit 9 (column 10, lines 43-47; column 19, lines 55-60); it would be well understood in the art that the driver unit 9 disclosed by Yamane et al. therefore provides a modulation current to the laser.

Regarding claims 41 and 42 in particular, Yamane et al. disclose that the temperature controlling element comprises a dual function heating/cooling device comprising a TE device (thermoelectric [TE] control element 6-2).

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. in view of Watanabe and Adams et al. as applied to claim 27 above, and further in view of Okazaki et al. (US 6,285,479 B1).

Regarding claim 29, Yamane et al. in view of Watanabe and Adams et al. describe a CWDM add/drop multiplexer structure with an active temperature control element for a plurality of lasers as discussed above with regard to claim 27.

Adams et al. teach filters in the add/drop multiplexer structure (column 2, paragraph [0005], but Yamane et al. in view of Watanabe and Adams et al. do not specifically suggest a

further temperature sensitive device wherein the temperature controlling element also maintains the controlled temperature environment around the further temperature sensitive device.

However, Okazaki et al. in particular teach a system related to the one described by Yamane et al. in view of Watanabe and Adams et al. including a WDM multiplexer structure used in an add/drop structure (Figure 11; column 21, lines 44-55). Okazaki et al. further teach that the add section 220 of the add/drop structure may further include WDM filters 226 that are temperature sensitive. In particular, Okazaki et al. disclose controlling the filters 226 using a wavelength setting control circuit (not explicitly shown in Figure 11, but disclosed in column 21, lines 64-67; details of the wavelength setting control circuit are shown in Figure 4 and include controlling a filter like filter 221 on the basis of temperature; column 10, lines 57-67; column 11, lines 1-3; column 12, lines 5-18).

Given the add/drop multiplexer structure including filters already described by Yamane et al. in view of Watanabe and Adams et al. as discussed above with regard to claim 1, it would have been obvious to a person of ordinary skill in the art to further protect the filters from temperature fluctuations as taught by Okazaki et al. in order to ensure the correct wavelength output of the laser transmitters. It also would have been obvious to a person of ordinary skill in the art to control the temperature environment around the filters as well as the lasers in order to ensure proper operation of the filters, since Okazaki et al. further teach that filters may be sensitive to temperature. One in the art would have been particularly motivated to extend the temperature-controlled environment originally disclosed by Yamane et al. to the filters as suggested by Okazaki et al. because Yamane et al. is already directed to ensuring the proper output of the laser transmissions using temperature control.

7. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. in view of Watanabe and Adams et al. as applied to claim 30 above, and further in view of Meyer et al. (US 6043456 A).

Regarding claim 9, Yamane et al. in view of Watanabe and Adams et al. describe a system as discussed above with regard to claim 27 and 30 including a temperature controlling device and a housing, but they do not specifically disclose that the housings comprise thermally insulated walls. However, Meyer et al. particularly teach that in a system for providing temperature control to a laser element within a housing, it would be advantageous to ensure that the housing was thermally insulated so that the temperature controlled environment within the housing would stay at that temperature (column 7, lines 8-13). Therefore, it would have been obvious to a person of ordinary skill in the art to insulate the walls as taught by Meyer of the housing in the system described by Yamane et al. in view of Watanabe and Adams et al. in order to preserve the temperature controlled environment around the laser components.

8. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. in view of Watanabe and Adams et al. as applied to claim 37 above, and further in view of Kasper et al. (US 5,740,191 A).

Regarding claim 14, Yamane et al. in view of Watanabe and Adams et al. describe a system as discussed above with regard to claims 27 and 37 including a driver unit that regulates a bias current, but they do not specifically disclose that the driver unit regulates the bias current based on the actual temperature of the laser.

However, Kasper et al. teach a system related to the one described by Yamane et al. in view of Watanabe and Adams et al., including a temperature controlled environment around a

laser (column 1, lines 61-65) and a driver unit that regulates a bias current of the laser (column 1, line 67; column 2, lines 1-3). Kasper et al. further teaches that the driver unit is arranged to control a bias current of the laser based on the actual temperature measured at the laser (column 3, lines 36-41). It would have been obvious to a person of ordinary skill in the art to regulate the bias current based on the laser temperature as taught by Kasper et al. in the system described by Yamane et al. in view of Watanabe and Adams et al. in order to provide a suitable bias current value based on temperature conditions and thereby further tune the inputs to the laser in response to changes in the temperature.

9. Claims 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al. in view of Watanabe and Adams et al. as applied to claim 28 above, and further in view of Swaminathan et al. (US 5,717,712 A).

Regarding claims 44 and 45, Yamane et al. in view of Watanabe and Adams et al. describe a system as discussed above with regard to claims 27 and 28 including reference temperatures and outside plant conditions. Yamane et al. do not specifically disclose that the high reference temperature is at least 70C or that the low reference temperature is 0C or less.

However, Swaminathan et al. teach an optical communication system related to the one described by Yamane et al. in view of Watanabe and Adams et al. including equipment located in outside plant situations, as (column 1, lines 12-20). Regarding claim 24 in particular, Swaminathan et al. further teach that in an outside plant environment, a laser may be controlled to a range where a high reference temperature is over 70C (specifically, Swaminathan et al. refers to 80C as a reference temperature; column 4, lines 13-16). Regarding claim 21 in

particular, Swaminathan et al. also further teach that in an outside plant environment, a laser may be controlled to a range where a low reference temperature is 0C (column 3, lines 29-30).

It would have been obvious to a person of ordinary skill in the art to specifically provide a high reference temperature that is at least 70C as taught by Swaminathan et al. in the system described by Yamane et al in view of Watanabe and Adams et al. in order to provide a practical high temperature limit that would still allow the lasers to function properly (while accommodating the higher temperatures that may be commonly experienced by the lasers in an outside plant environment). Similarly, it would have been obvious to a person of ordinary skill in the art to specifically provide a low reference temperature that is 0C or below as taught by Swaminathan et al. in the system described by Yamane et al. in view of Watanabe and Adams et al. in order to provide a practical low temperature limit that would still allow the lasers to function properly (while accommodating the lower temperatures that may be commonly experienced by the lasers in an outside plant environment).

Response to Arguments

10. Applicants' arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

11. Regarding the objection to the drawings, Examiner respectfully disagrees with Applicants' assertion on page of their response that descriptive labels in the figures would "make them more difficult to understand." Again, Examiner respectfully notes that the figures are not literal depictions of Applicants' invention and the elements are only represented by symbols (rectangles of various size) that are similar in appearance and have no particular established meaning in the art. Therefore, descriptive labels are necessary to distinguish between, for

example, "O/E Converter 128," "CWDM 118," "Thermoelectric Device 120," "Monitor Unit 112," etc. in the figures.

Conclusion

12. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 until July 15, 2005; on or after July 15, 2005, the fax number is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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